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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,951	02/19/2004	Mark Stuart Vinton	DOL126	4809

25271 7590 04/04/2008
GALLAGHER & LATHROP, A PROFESSIONAL CORPORATION
601 CALIFORNIA ST
SUITE 1111
SAN FRANCISCO, CA 94108

EXAMINER	
GODBOLD, DOUGLAS	

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
04/04/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,951	VINTON ET AL.	
	Examiner	Art Unit	
	DOUGLAS C. GODBOLD	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _30 January 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-24_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-24_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to correspondence filed January 30, 2008 in reference to application 10/783,951. Claims 1-24 are pending in the application and have been examined.

Response to Amendment

2. The Amendment filed January 30, 2008 has been accepted and considered in this office action. Claims 3-5, 8, 9, 12-14, and 17-24 have been amended.

Response to Arguments

3. Applicant's arguments, see Remarks, filed January 30, 2008, with respect to the rejection(s) of claim(s) 1-24 under 35 U.S.C 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Thumpudi et al (US PAP 2005/0015259).

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 1-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Davidson et al (US Patent 5,394,473) in view of Thumpudi et al. (US PAP 2005/0015259).

6. Regarding **claim 1**, DAVIDSON teaches a method for generating an output signal that comprises:

receiving samples of a source signal having spectral content ("quantized input signal x(t)", DAVIDSON, column 20, lines 1-2);

applying a primary transform ("E-TDAC utilizes a transform function", DAVIDSON, column 19, line 13) to overlapping segments of the samples ("overlap the first set by one-half block length", DAVIDSON, column 20, lines 6-7) to generate a plurality of sets of spectral coefficients ("produces one of two sets of spectral coefficients", DAVIDSON, column 19, lines 39-40), wherein each set of spectral coefficients has time-domain aliasing artifacts ("produces a time-domain aliasing component", DAVIDSON, column 20, line 16) and represents the spectral content of a respective source signal segment for a set of frequencies ("each transform block represents one time domain signal sample block", DAVIDSON, column 19, lines 66-67);

obtaining a plurality of spectral coefficients representing the same frequency in the set of frequencies from the plurality of sets of spectral coefficients ("when the appropriate number of data b bits representing transform coefficients have been buffered", DAVIDSON, column 32, lines 66-68. As this transform is done on each frame, when the frame is the same size, the coefficients will represent the same

frequency from frame to frame) and assembling the plurality of spectral coefficients into one or more blocks of spectral coefficients ("that data may be formatted", DAVIDSON, column 33, line 1), wherein the number of spectral coefficients that are assembled in each of the one or more blocks is adapted in response to a block-length control signal ("Dynamic-Frame Alignment with the E-TDAC transform is able to select any subblock length L", DAVIDSON, column 31, lines 44-45); and

assembling information representing the one or more sets of transform coefficients and the block-length control signal into the output signal ("assembles the quantized transform coefficients and signal sample block length for transmission or storage", DAVIDSON, column 32, lines 48-50).

However, DAVIDSON does not disclose:

applying a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients, wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal.

In the same field of signal processing, THUMPUDI teaches applying a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients (Figure 5, M/C Transformer 550 applies transform to frequency coefficient data; paragraph 0131. As this is a DCT transform applied to frequency coefficients, the results is a hybrid-transform coefficients), wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal (It is

inherent, as transformer 550 applies transform to coefficients of frequency transformer 530, the transformer 550 would be reliant on window size outputted in transformer 530.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the secondary transform of THUMPUDI on the coefficients of DAVIDSON in order to give more precise control to a coder when coding heavily correlated signals (THUMPUDI paragraph 0131).

7. Regarding **claim 2**, DAVIDSON and THUMPUDI further teach that the primary transform is a Modified Discrete Cosine Transform ("E-TDAC utilizes a transform function which is equivalent to the alternate application of a modified Discrete Cosine Transform", DAVIDSON, column 19, lines 13-15) and the secondary transform is a Discrete Cosine Transform that is applied to blocks of spectral coefficients that do not overlap one another (M/C transform can be a DCT based algorithm, THUMUDI paragraph 0131. There is no overlap mentioned in description of M/C Transform).

8. Regarding **claim 3**, DAVIDSON further teaches:

generating a measure of similarity for spectral component magnitudes within a Plurality of sets of spectral components ("transient detector monitors the input signal for rapid changes in amplitude", DAVDSON, column 22, lines 4-5); and

generating the block-length control signal in response to the measure of similarity (selects short signal sample blocks when sufficiently large changes in amplitude are detected", DAVDSON, column 22, lines 5-7).

9. Regarding **claim 4**, DAVIDSON further teaches:

analyzing samples of the source signal to generate a segment-length control signal ("transient detector monitors the input signal for rapid changes in amplitude", column 22, lines 4-5); and

applying an analysis window function to a segment of samples of the source signal, wherein shape or length of the analysis window function is adapted in response to the segment-length control signal (selects short signal sample blocks when sufficiently large changes in amplitude are detected", DAVDSON, column 22, lines 5-7).

10. Regarding **claim 5**, DAVIDSON further teaches that the primary transform has a set of basis functions and the method comprises adapting the set of basis functions in response to the segment-length control signal (see DAVDSON, column 19, equations 1 and 2, the transforms are dependent on N, where N represents the signal sample block length).

11. Regarding **claim 6**, DAVIDSON teaches a method for generating an output signal that comprises:

receiving an input signal that represents spectral content of a source signal ("digitized and coded signal is received", DAVIDSON, column 33, lines 17-18);

obtaining one or more sets of transform coefficients and a block-length control signal from the input signal ("extracts the quantized transform coefficients and any side information", DAVIDSON, column 33, lines 21-22);

assembling the spectral coefficients into sets of spectral coefficients ("transform coefficients are converted into a linear form of representation", DAVIDSON, column 33, lines 23-24.), wherein each set of spectral coefficients has time-domain aliasing artifacts ("produces a time-domain aliasing component", DAVIDSON, column 20, line 16) and represents the spectral content of a segment of the source signal for all frequencies in the set of frequencies ("each transform block represents one time domain signal sample block", DAVIDSON, column 19, lines 66-67);

applying an inverse primary transform to the sets of spectral coefficients ("transform each set of frequency-domain transform coefficients", DAVIDSON, column 33, lines 34-35) to generate output signal segments that correspond to segments of the source signal ("block of time-domain signal samples", DAVIDSON, column 33, lines 36-37), wherein the inverse primary transform substantially cancels the time-domain aliasing artifacts ("this distortion is cancelled", column 34, lines 25-26).

However, DAVIDSON does not disclose:

applying an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of

frequencies, wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal.

In the same field of signal processing, THUMPUDI teaches applying an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of frequencies (Figure 6, Inverse M/C Transformer 640, paragraph 0145. This is inverse of Figure 5, M/C Transformer 550 which applies transform to frequency coefficient data; paragraph 0131, which will have constant coefficients representing the same frequency from window to window. As this is a DCT transform applied to frequency coefficients, the results is a hybrid-transform coefficients), wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal (It is inherent, as transformer 550 applies transform to coefficients of frequency transformer 530, the transformer 550 would be reliant on window size outputted in transformer 530).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the secondary transform and secondary inverse transform of THUMPUDI on the coefficients of DAVIDSON in order to give more precise control to a coder when coding heavily correlated signals (THUMPUDI paragraph 0131).

12. Regarding **claim 7**, DAVIDSON and THUMPUDI further teach that the inverse primary transform is an Inverse Modified Discrete Cosine Transform ("inverse discrete transforms for E-TDAC used in an embodiment of the invention are alternating applications of a modified inverse DCT", DAVIDSON, column 33, lines 39-42) and the inverse secondary transform is an Inverse Discrete Cosine Transform that is applied to sets of hybrid-transform coefficients representing blocks of spectral coefficients that do not overlap one another (M/C transform can be a DCT based algorithm, THUMUDI paragraph 0131. There is no overlap mentioned in description of M/C Transform).

13. Regarding **claim 8**, DAVIDSON further teaches:

obtaining a segment-length control signal from the input signal ("side information passed by the encoder", DAVIDSON, column 33, lines 22-23); and

applying a synthesis window function to an output signal segment, wherein shape or length of the synthesis window function is adapted in response to the segment-length control signal ("signal sample block length is used to choose the appropriate synthesis window function", DAVIDSON, column 33, lines 27-28).

14. Regarding **claim 9**, DAVIDSON further teaches that the inverse primary transform has a set of basis functions and the method comprises adapting the set of basis functions in response to the segment-length control signal (see DAVIDSON, columns 33-34, equations 21 and 22, the transforms are dependent on N, where N represents the sample block length).

15. Regarding **claim 10**, DAVIDSON teaches an apparatus for generating an output signal that comprises:

(a) an input terminal ("time-domain signal input 102", DAVIDSON, column 15, line 39);

(b) an output terminal ("transmission path 122", DAVIDSON, column 15, line 58); and

(c) signal processing circuitry coupled to the input terminal and the output terminal (see DAVIDSON, FIG. 1a), wherein the signal processing circuitry is adapted to:

receive samples of a source signal having spectral content ("quantized input signal x(t)", DAVIDSON, column 20, lines 1-2);

apply a primary transform ("E-TDAC utilizes a transform function", DAVIDSON, column 19, line 13) to overlapping segments of the samples ("overlap the first set by one-half block length", DAVIDSON, column 20, lines 6-7) to generate a plurality of sets of spectral coefficients ("produces one of two sets of spectral coefficients", DAVIDSON, column 19, lines 39-40), wherein each set of spectral coefficients has time-domain aliasing artifacts ("produces a time-domain aliasing component", DAVIDSON, column 20, line 16) and represents the spectral content of a respective source signal segment for a set of frequencies ("each transform block represents one time domain signal sample block", DAVIDSON, column 19, lines 66-67);

obtain a plurality of spectral coefficients representing the same frequency in the set of frequencies from the plurality of sets of spectral coefficients ("when the appropriate number of data b bits representing transform coefficients have been buffered", DAVIDSON, column 32, lines 66-68. As this transform is done on each frame, when the frame is the same size, the coefficients will represent the same frequency from frame to frame) and assembling the plurality of spectral coefficients into one or more blocks of spectral coefficients ("that data may be formatted", DAVIDSON, column 33, line 1), wherein the number of spectral coefficients that are assembled in each of the one or more blocks is adapted in response to a block-length control signal ("Dynamic-Frame Alignment with the E-TDAC transform is able to select any subblock length L", DAVIDSON, column 31, lines 44-45); and

assemble information representing the one or more sets of transform coefficients and the block-length control signal into the output signal ("assembles the quantized transform coefficients and signal sample block length for transmission or storage", DAVIDSON, column 32, lines 48-50).

However, DAVIDSON does not disclose:

applying a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients, wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal.

In the same field of signal processing, THUMPUDI teaches applying a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients (Figure 5, M/C Transformer 550 applies transform to frequency coefficient data; paragraph 0131. As this is a DCT transform applied to frequency coefficients, the results is a hybrid-transform coefficients), wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal (It is inherent, as transformer 550 applies transform to coefficients of frequency transformer 530, the transformer 550 would be reliant on window size outputted in transformer 530.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the secondary transform of THUMPUDI on the coefficients of DAVIDSON in order to give more precise control to a coder when coding heavily correlated signals (THUMPUDI paragraph 0131).

16. Regarding **claim 11**, DAVIDSON and THUMPUDI further teach that the primary transform is a Modified Discrete Cosine Transform ("E-TDAC utilizes a transform function which is equivalent to the alternate application of a modified Discrete Cosine Transform", DAVIDSON, column 19, lines 13-15) and the secondary transform is a Discrete Cosine Transform that is applied to blocks of spectral coefficients that do not overlap one another (M/C transform can be a DCT based algorithm, THUMUDI paragraph 0131. There is no overlap mentioned in description of M/C Transform).

17. Regarding **claim 12**, DAVIDSON further teaches that the signal processing circuitry is adapted to:

generate a measure of similarity for spectral component magnitudes within a plurality of sets of spectral components ("transient detector monitors the input signal for rapid changes in amplitude", DAVDSON, column 22, lines 4-5); and

generate the block-length control signal in response to the measure of similarity (selects short signal sample blocks when sufficiently large changes in amplitude are detected", DAVDSON, column 22, lines 5-7).

18. Regarding **claim 13**, DAVIDSON further teaches that the signal processing circuitry is adapted to:

analyze samples of the source signal to generate a segment-length control signal ("transient detector monitors the input signal for rapid changes in amplitude", column 22, lines 4-5); and

apply an analysis window function to a segment of samples of the source signal, wherein shape or length of the analysis window function is adapted in response to the segment-length control signal (selects short signal sample blocks when sufficiently large changes in amplitude are detected", DAVDSON, column 22, lines 5-7).

19. Regarding **claim 14**, DAVIDSON further teaches that the primary transform has a set of basis functions and the method comprises adapting the set of basis functions in

response to the segment-length control signal (see DAVDSON, column 19, equations 1 and 2, the transforms are dependent on N, where N represents the signal sample block length).

20. Regarding **claim 15**, DAVIDSON teaches an apparatus for generating an output signal that comprises:

(a) an input terminal ("signal input 132", DAVIDSON, column 15, line 62);

(b) an output terminal ("signal output 150", DAVIDSON, column 16, line 10); and

(c) signal processing circuitry coupled to the input terminal and the output terminal (see DAVIDSON, FIG. lb), wherein the signal processing circuitry is adapted to:

receive an input signal that represents spectral content of a source signal ("digitized and coded signal is received", DAVIDSON, column 33, lines 17-18);

obtain one or more sets of transform coefficients and a block-length control signal from the input signal ("extracts the quantized transform coefficients and any side information", DAVIDSON, column 33, lines 21-22);

assemble the spectral coefficients into sets of spectral coefficients ("transform coefficients are converted into a linear form of representation", DAVIDSON, column 33, lines 23-24), wherein each set of spectral coefficients has time-domain aliasing artifacts ("produces a time-domain aliasing component", DAVIDSON, column 20, line 16) and represents the spectral content of a segment of the source signal for all frequencies in the set of

frequencies ("each transform block represents one time domain signal sample block", DAVIDSON, column 19, lines 66-67);

apply an inverse primary transform to the sets of spectral coefficients ("transform each set of frequency-domain transform coefficients", DAVIDSON, column 33, lines 34- 35) to generate output signal segments that correspond to segments of the source signal ("block of time-domain signal samples", DAVIDSON, column 33, lines 36-37), wherein the inverse primary transform substantially cancels the time-domain aliasing artifacts ("this distortion is cancelled", column 34, lines 25-26).

However, DAVIDSON does not disclose:

applying an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of frequencies, wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal.

In the same field of signal processing, THUMPUDI teaches applying an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of frequencies (Figure 6, Inverse M/C Transformer 640, paragraph 0145. This is inverse of Figure 5, M/C Transformer 550 which applies transform to frequency coefficient data; paragraph 0131, which will have

constant coefficients representing the same frequency from window to window. As this is a DCT transform applied to frequency coefficients, the results is a hybrid-transform coefficients.), wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal (It is inherent, as transformer 550 applies transform to coefficients of frequency transformer 530, the transformer 550 would be reliant on window size outputted in transformer 530.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the secondary transform and secondary inverse transform of THUMPUDI on the coefficients of DAVIDSON in order to give more precise control to a coder when coding heavily correlated signals (THUMPUDI paragraph 0131).

21. Regarding **claim 16**, DAVIDSON and THUMPUDI further teach that the inverse primary transform is an Inverse Modified Discrete Cosine Transform ("inverse discrete transforms for E-TDAC used in an embodiment of the invention are alternating applications of a modified inverse DCT", DAVIDSON, column 33, lines 39-42) and the inverse secondary transform is an Inverse Discrete Cosine Transform that is applied to sets of hybrid-transform coefficients representing blocks of spectral coefficients that do not overlap one another (M/C transform can be a DCT based algorithm, THUMUDI paragraph 0131. There is no overlap mentioned in description of M/C Transform).

22. Regarding **claim 17**, DAVIDSON further teaches that the signal processing circuitry is adapted to:

obtain a segment-length control signal from the input signal ("side information passed by the encoder", DAVIDSON, column 33, lines 22-23); and

apply a synthesis window function to an output signal segment, wherein shape or length of the synthesis window function is adapted in response to the segment-length control signal ("signal sample block length is used to choose the appropriate synthesis window function", DAVIDSON, column 33, lines 27-28).

23. Regarding **claim 18**, DAVIDSON further teaches that the inverse primary transform has a set of basis functions and the method comprises adapting the set of basis functions in response to the segment-length control signal (see DAVIDSON, columns 33-34, equations 21 and 22, the transforms are dependent on N, where N represents the sample block length).

24. Regarding **claim 19**, the rejection is based on the same reason described for claim 1, because the claim recites the same or similar limitation(s) as claim 1.

25. Regarding **claim 20**, the rejection is based on the same reason described for claim 2, because the claim recites the same or similar limitation(s) as claim 2.

26. Regarding **claim 21**, the rejection is based on the same reason described for claim 4, because the claim recites the same or similar limitation(s) as claim 4.

27. . Regarding **claim 22**, the rejection is based on the same reason described for claim 6, because the claim recites the same or similar limitation(s) as claim 6.

28. Regarding **claim 23**, the rejection is based on the same reason described for claim 7, because the claim recites the same or similar limitation(s).as claim 7.

29. Regarding **claim 24**, the rejection is based on the same reason described for claim 8, because the claim recites the same or similar limitation(s) as claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS C. GODBOLD whose telephone number is (571)270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCG
/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2626